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SHOEBURYNESSE.

THE northern bank of the Thames ends very abruptly opposite Sheerness, in the headland known as Shoeburyness. Here, in a quiet out-of-the-way corner of Essex, lies the government reserve, occupying some two hundred and seventy acres, where most of the experiments in artillery of our land-service are carried on.

It is a difficult place to arrive at, for, though surrounded on nearly three sides by the sea, yet the high and extensive sands render it inaccessible to any but the shallow barges which ply up and down—from Woolwich or London with government stores and ammunition, or forage and coals. On the land-side, too, it is not easy for a stranger to discover, for the rail from London does not extend further than Southend, a small yet rising watering-place about five miles from Shoebury—government having wisely prohibited more immediate railway communication with her little military colony.

Shoeburyness was formerly well known to the Danes, who made a settlement here for predatory purposes, and built a stronghold or fort, which, from its horseshoe shape, they called Skoen-berg—Anglicised into Shoebury, and of which there are traces still visible in the middle of the government land; and from hence, in their small craft, they would surprise and prey upon the ships laden with merchandise for the port of London.

Shortly before the Crimean war, when the attention of artillerists had been called to the increasing necessity for ordnance of longer range, Shoeburyness was recommended to government, for the great range and security to be had over the extensive sands, and the facility of transport of guns and stores from the arsenal at Woolwich. The latter advantage, indeed, becomes an absolute necessity, as it would be impracticable to move thither by rail the huge weights and masses of metal, such as guns, shields, iron targets, embrasures, &c. which are easily brought down by water.

Almost the first object that catches the sight

from the river, or along the shore, is a very large pair of sheers, which form a fine landmark. They are two wooden spars, over sixty feet high, fitted into movable sockets, and made to bend over so as to lift any weight out of a lighter or barge brought alongside the pier on which they stand. To them are attached two sets of chains and pulleys, registered to lift fifty tons weight. The machinery by which both the sheers and pulleys are worked is of great power; and it is surprising to see the ease and rapidity with which the well-trained gunners can shift the position of the sheers with enormous weights attached to them. They are placed on a pier-head, and under them runs a line of rails, so that targets or guns of any weight may be easily drawn from the side of the vessel to the battery or position where they are to be experimented on.

There are two departments at Shoeburyness—the School of Gunnery, and the Experimental Department. Of these, the oldest and principal is the Experimental, presided over by the Ordnance Select Committee, and conducted by a superintendent and assistants. By these have been carried on the long experiments upon the comparative merits of Armstrong, Whitworth, Britten, Scott, Lancaster, and other systems, the French and Swedish guns, and the various adaptations by Palisser, Miller, and others; as well as the perpetual trials of new powder, shot, shells, and projectiles of all descriptions. Here, too, are tried, by battering with shot and shell, each new system of iron-plating for ships, embrasures, and casemates; here we find iron-plates by scores, varying in thickness from three inches to eleven and twelve of iron, with a couple of feet of wood-backing, or eight or ten feet of granite; plates of all kinds, cast-iron, wrought-iron, and steel of all tempers—tried, punished, and riddled with almost every kind of shot known; some that admitted the shot through them without more ado; some that offered enough resistance, to cause all the greater destruction behind from the splinters; others of tougher material, which, though they must let the shot through, are bent up at the edges like bits of crumpled paper; others, again, so enduring that the huge mass that

plunged into them, lies embedded in the plate, having pushed its nose only through to the other side, perhaps. There is one that has dents like saucers in it, as if nothing could pierce it; but this is the celebrated Hercules target, which was not pierced: however, it was not tried with our heaviest shot or the highest charges of powder. But look at this one. Woe be to the ship that is treated in this way, for you see that though it has some nine or ten inches of iron, and a very stiff wooden backing, it was pierced—in this case by a shell, which pushed its way nearly through the metal, and then burst. Look at the fifteen inches of oak behind, and the iron 'skin' behind that, shattered into hundreds of splinters, and most of the bolts and rivets started or broken off altogether. Better to have no resistance at all, you will say, than such a treacherous one as that. But go on a little further, and let us look at this large casemate and embrasure. Here is a spacious vaulted chamber for men, guns, powder-magazines, &c. and a small embrasure just wide enough to admit the muzzle of the gun. The iron is eleven inches thick, in horizontal layers, kept firmly together by plates before and behind, and backed by solid masonry; and you may see what frightful havoc was made with it by firing at it at a distance of one thousand yards. The whole place is knocked to pieces; the granite, eight and ten feet thick, split into halves; the gun not dismounted only, but broken up into bits; the whole archway of the casemate destroyed, and blocks of granite carried bodily away to some distance. This has shewn the uselessness of this kind of embrasure, and still more of granite walls. Still men must be protected while working ordnance; and it is becoming every day more evident that we shall have, sooner or later, to protect our shores and towns with earthworks and revolving turrets, in which to work heavy guns.

Let us pass on to that battery, and see what is going on. It is the new pattern of the muzzle-loading rifled nine-inch gun. The report of it is perfectly deafening, and well it may be, for, do you see, they are putting in something like a bolster into the gun. That, we are told, is a charge of forty-five pounds of powder, and the shot weighs three hundred pounds. But that is every way only half as large as this huge six hundred-pounder. This has been fired with some fifty odd rounds, when it then burst, for the metal could not stand the enormous charges. It is made of a steel 'core' or tube next the bore, with seven wrought-iron tubes, called 'coils,' shrunk on to it; that is, each is made so as to slip one over the other while at a red-heat, and as it cools, it contracts; thus holding the inner one as in a vice. The steel core could not stand the high charge, and opened at the grooves; to do this, it had to expand the other coils, which it did until two of the outer ones split open the whole of their length. The first six hundred-pounder, known as Big Will, had not a steel core, and stood five hundred rounds, and was undamaged at the end of it. From this, it is considered that the best wrought-iron is superior to steel in withstanding the pressure of explosion beyond a certain degree. Both these six hundred-pounders were turned out at the Elswick factory: the first was considered a very good one; the second burst; and a third—supposed to be superior to these two—is being made. This one is marked on its trunnions 51,074 pounds-weight, or over twenty-two tons; its greatest circumference is close

upon sixteen feet; and the bore is so large that you can easily put your head in it, and see the bottom of the bore. Yet, with these enormous proportions, it could not stand the high charges with which it was proved. The first two rounds were one hundred pounds of large-grained powder, and six-hundred-pound shot; the succeeding ones varied down to seventy-five pounds of powder, and five-hundred-and-fifty pound shot, till it burst at the fifty-fifth round. During these experiments, the remarkable appearance of each shot in its flight attracted great attention. After it had passed through the first five hundred or six hundred feet of its flight, a white halo was visible round the base of the shot, and became larger and more distinct until the shot struck the ground at its first graze. This peculiarity had never been observed before; in fact, it could hardly be produced with any projectile but those of such large calibre and weight.

The following is supposed to be the *rationale* of the phenomenon. In the case of a shot weighing from five hundred pounds to six hundred pounds, fired with charges varying from seventy-five pounds to one hundred pounds, it will readily be perceived that the pressure on the base of the shot must be much greater than in the case of a light projectile and lower charge. The gases thus liberated by the explosion become highly condensed behind the shot in the bore. Now, every shot moving with a greater velocity than that with which the air can close round it, carries behind it a vacuum, which becomes less perfect as the shot is retarded. In the instances noticed, it seems that a small portion of the highly condensed gases and vapour released by the explosion, filled the large vacuum behind the shot; and that these became visible, and by degrees clearer and more defined, as the shot lost velocity, and the air gradually mingled with them—in the same manner as the steam escaping from a boiler is so condensed that it must rise and mix with the air before it becomes perceptible. Two circumstances bear out this theory on the subject. Firstly, under a good telescope, this white halo presented a *radial* appearance, owing, no doubt, to the rotation imparted to the contained gases by the rifling of the shot—causing them in their escape to fly off tangentially. The second corroboration is, that at its first graze, the halo disappeared from behind the shot; or, carrying out the theory, the concussion against the ground dislodged the receptacle of the gases, and thus released them.

But let us stand behind this eight-inch gun while they are firing, where the report is less deafening, and where we can see the flight of the shot. You see the shot fall close by a line of pegs, called the range. These pegs are placed at an interval of fifty yards from each other, and are marked with their distance from the battery. There are thirteen or fourteen different ranges for the several batteries, laid out for special purposes—some for the trial of particular guns. The longest range is marked up to ten thousand yards; and the sands stretch as far again in that direction to low-water mark. The greater part of these sands belong to neighbouring manors, and government pays an annual sum of two hundred and fifty pounds for the right of firing over them; for in this country, as in many others, by a very old feudal law, the manorial rights extend 'as far as a man may ride on a roan horse into the sea.' The whole of this tract in

government use is carefully marked out with buoys and landmarks.

As they have ceased firing with this gun, let us go forward and examine those posts in front. There is an open frame about ten feet square attached to them, which we saw lowered after every shot. Down the sides of this frame are pins an inch apart; round these is wound, from side to side, a continuous copper wire; and forty feet further along the range are another couple of posts and a similar frame with wire. Every shot passes through these two, and cuts the wire, when the frame is pulled down, to have the wire renewed. The use of these is to ascertain the initial velocity of the shot. The ends of these wires are in connection with a galvanic battery a quarter of a mile off, which works a dial graduated to thousandths of a second. The gun is laid so that the shot shall pass through and cut both wires. The effect of cutting the nearest wire is to set the clock-work of the dial going, and of the second to stop it. This is performed so instantaneously by the aid of electricity as to give an exact reading of the minute portion of a second that the shot took to traverse the forty feet between the wires. This complicated and beautiful apparatus is the invention of a M. Namez, of the Belgian artillery, and is considered one of the most perfect combinations of chemistry and mechanics for practical purposes.

Let us stop this sergeant, and learn what he is holding. It is a circular disc of canvas, stretched over a hoop about thirty inches in diameter, and held by a wooden handle about three feet long. It is painted black on one side, and white on the other. He tells us it is used for signalling. There is a man half a mile off who is talking with him by means of a similar one. You may notice that we see him against the sky on a parapet, therefore he shews us the black side; but this man shews him the white, because the sun is shining on it, and he can see it better than the black. He is signalling now. He twists the handle in his hand so as to turn it alternately perpendicular and visible to the other man, and then horizontal or invisible; and signs are made by the number and duration of the times it is visible; thus, one long and two short, two short, one long and one short, two long, one short and one long. This means: 'There will be practice to-morrow from the mortar battery.' There are two codes of signals—one of letters, by which words are spelled out; the other, an arbitrary one of numbers, similar to the naval code of flags, and made and read off according to a book of signals. Of course there are several methods of using these codes: one by the discs we have seen; another by a framework of slots similar to a Venetian blind, which are opened and shut simultaneously with one handle: this may be advantageously used against the white side of a house, or the sky.

Another contrivance is a piece of black canvas stretched over hoops, and which, when pulled open, looks like a barrel, or one of the signals used at naval stations to shew the weather. It closes together by a spring; so that, pulling it open for short or long spaces, and letting it close by itself, you may make the same signals. By night, a similar adaptation of signals is used, by flashing—that is, by uncovering, for the same spaces, a lantern containing a powerful light. It is easy to learn to use these instruments; the hand soon becomes accustomed to make the spaces quickly, and the eye to read them off; and the principle is

a very good one for signalling to great distances. It is the invention of an officer in the line. The large slots on the splinter-proof may be seen on a clear day at Sheerness, which is six miles distant; and with the aid of a large lamp and a powerful light, these signals may be distinguished on a clear night at great distances—eighteen or twenty miles. They would, of course, be extremely useful in case of war—always supposing that the code in use does not fall into the enemy's hands, as the French naval code did when Lord Cochrane seized one of their brigs with a copy on board, and managed to delude them with their own signals.

It would be difficult to count the varieties of guns here, mounted and dismounted, and issued or not as sealed patterns for service. So different are the occasions, the positions, and uses for which guns are required, that there must be, of necessity, many kinds; but the object of government now is to simplify these as much as possible, and to reduce their numbers. This, when accomplished, will save an immense amount of labour and confusion, both in their manufacture, their transport, and use. To this end are the constant experiments going on with guns of various merits and powers, and with different kinds of gunpowder as well as projectiles. Here lie guns of every sort—rifled nine-inch and eight-inch guns of various patterns; sixty-eight pounders; eight-inch smooth bores; thirty-twos bored up, and with a rifled steel coil screwed into it; Armstrongs of all calibres—one hundred and ten pounds, or seven-inch, forty-pounders, twenty-pounders, twelve, and nine; wedge guns; foreign guns of various forms, as the French and the Engström; smooth-bore service-guns of all calibres; mortars; old guns mounted on new pattern carriages to be experimented on; carriages with curiously fashioned wheels. Here is a gun without any trunnions at all; it does not lie on its carriage, but the carriage seems to fit into it: in place of trunnions, it has slots in its sides, into which projections on the sides of the carriage run. This is an arrangement to diminish recoil.

With regard to gunpowder, the present idea seems in favour of the large-grained. They are trying a powder with grains as large as peas, and hollow, called pellet-powder; but it is not thought well of, as too quick in combustion. At one of the batteries yonder, they are trying gunpowder mixed with charcoal, to obtain a less rapid ignition of the charge—it is the reason of that very black smoke. There, again, is an Armstrong: you may know it by the slow flight of the shot, and the peculiarly dense and yellow hue of the smoke: this is due to the large amount of lubricating grease made up in each cartridge.

The School of Gunnery is one of the most efficient and practical of our military institutions. It has several classes, called 'courses.' The chief of these is for the instruction of officers and non-commissioned officers (in the proportion of one of the former and two of the latter per brigade annually) in practical artillery, such as the entire service of rifled guns, and light and smooth bore ordnance and rocket-drill, pontooning and bridge-making. This course occupies a period of fifteen months, of which the first three are spent at Woolwich in a theoretical course of science as applied to artillery, such as electricity, mechanics, chemistry, &c. There are also shorter courses of instruction—one in rifled ordnance; another in the service of heavy ordnance, which includes the drill and practice

with the larger guns and mortars, mounting and dismounting guns by various methods, and gun and sheer drill; another is the annual practice of the mounted batteries; another, that of the garrison batteries. These various drills are superintended by four officers—a principal instructor in gunnery, and three assistants, with a staff of non-commissioned officers. There are usually three batteries of garrison artillery temporarily stationed at Shoebury, to undergo the various courses of instruction, to perform the general duties of the garrison, and the fatigue-works of the experimental department. For these purposes, they generally remain eight or ten weeks, and are then relieved by others in their turn. Besides these, during the drill-season, several batteries of the horse and field brigades are sent down to carry on their annual practice; so that in the course of every twelve months several hundred men and officers have been under instruction. This is rather a quiet day; there seems more drill going on than practice, yet you feel rather bewildered with five or six guns blazing about you; but often, during the summer months, you would be deafened with the reports of a dozen pieces firing in every direction; and if you happen to be strolling along the beach, you may have to keep a sharp look-out for the various danger-flags, if you are not altogether stopped by the sentries. If we walk a few hundred yards further, we can visit the drill-shed, the lecture and drawing rooms. In the former—one of the finest of its kind in England—you may sometimes see one hundred and fifty men or more at artillery-drill of all kinds; here two or three detachments are drilling with thirty-two-pounders in a wooden casemate, and rushing about as if the fire of a dozen guns were on them; behind them are another batch of men, working at sixty-eight-pounders on traversing-platforms. In the middle of the shed is a large squad of the 'long course' dismounting a gun from a travelling-platform; and from long practice at working together, they seem to make light of its fifty hundredweights, and treat it as a toy. Beyond them is a party raising a gun by means of a triangle gyn. The other end of the shed is devoted to Armstrong guns, where a fresh battery is being initiated into the mysteries of time-fuses and tangent scales; while near the end-wall is a batch of recruits learning the intricacies of all kinds of knots and bends. You were noticing just now how the officers and non-commissioned officers were mixed together at drill, hauling on the same ropes, and working together, and the difference between this and the parade of a regiment of the line, where the officers are supposed only to command; but this is the *régime* of the place. While at this instruction, just as there is no royal road to learning, so while at work, difference of rank subsides, and all put their shoulders equally to the wheel. And this must needs have a beneficial effect on both; for as there is the same respect paid from the soldier to his superior as ever, this is one of the few occasions where familiarity does not breed contempt; for, on the contrary, by mutual help, the officer gains trust and interest in his men; and the men, esteem for their officers.

At one end of the shed is the drawing-room. Here are a number of non-commissioned officers, learning military drawing. Some of their best etchings and sketches hang round the room; and beautifully done they are; for most of them have the appearance of engravings, even under a close

inspection. At the other end is the model and lecture room. The walls are covered with drawings of machinery used in making gunpowder, bullets, and shot; and with photographs of various subjects, and models, *en petit*, of guns and carriages.

Shoeburyness is found to be one of the healthiest stations in England, for in a garrison of about five hundred souls—in spite of the great heat in summer on these marshes, and exposure to the bitter cold of the north and east winds in winter—the office of surgeon is almost a sinecure, there being but a very small percentage of sick, and very rarely an accident, owing to the careful arrangements that are necessary with such dangerous arms and materials.

The practical nature of the duties, and rough and hard work at Shoeburyness, present to a stranger an appearance of much more real and business-like preparation for the sterner field of active service than do the more formal and precise, yet feather-bed soldiery and etiquette of a garrison town; and teaches a large and magnificent arm of our service that an intimate acquaintance with the thews and sinews of war, and with the smallest details of their work, and an aptitude for applying all available resources at hand in time of difficulty, must underlie all the amenities of home-service, and the more sedentary accomplishments of the pen and red-tape.

It is extremely to be regretted that the authorities at the Horse Guards are so impairing the efficiency of the brigades of garrison artillery by diminishing the field of their scientific employments, and reducing them to little more than the narrow limits of battalion and company drill, and garrison duties, that belong essentially to the regiments of the line; and that they are gradually taking from them professional duties peculiarly their own, such as surveying and astronomy, telegraphy, pontooning, and the construction of their own earthworks and batteries in the field.

In spite of all that has been fulminated by papers actuated by party-spirit or private ill-will; in spite of omissions and defects that must be discovered in all human judgments—it is impossible to overlook the fact that, since the days of the last war, our two establishments—the arsenal at Woolwich, the largest and most inexhaustible in the world; and the experimental department at Shoeburyness—have kept the *matériel* ahead of that of all foreign nations; while the School of Gunnery, though later established, has had an important effect in educating and improving our *personnel*—combining to render our Regiment of Artillery still foremost among the armies of the earth.

WINTER-LIFE IN LAPPMARK.

TAKING THE CENSUS.

I ACCEPTED the offer of accompanying an official one winter, whose duty it was to take the census in Finnmarken, Norway's most northerly province. It was not a very pleasant time for travelling in the far north; nor was it without feelings of regret that I arose from my warm bed, with its eider-down quilt, in Tromsø, the morning of my departure, for I knew it would be some weeks before I should sleep so comfortably again.

In perfect health, in warm fur-cloaks, ditto caps and gloves, and boots of seal-skin, we left home,

on the said biting February morning, on a journey that would take us three weeks, during which it would be an impossibility to sleep under what is properly termed a roof.

The weather, which of late had been very stormy, cleared up, which fact, as we had a hundred and fifty miles to travel before reaching the first Lapp, was no undesirable thing. Of course, we travelled in sledges drawn by reindeer. It is not an unpleasant mode of transit, provided one has a good deer, and knows how to drive it. Of course, a tyro must expect to be turned over about every hundred yards; but an experienced whip, by hand, voice, and eye, can make a well-disposed reindeer do what he likes. But sometimes they take it into their heads to be disagreeable; indeed, I remember once laughing as if I should kill myself at a friend of mine who had a vicious deer. All at once, the animal turned right round, and looked at the driver, as much as to say: 'You lay that rope across my back again, and I'll let you know where you are!' The driver, however, did soon after give him another touch, when round whips the deer, and charges his driver, and sends him spinning into the snow. Laughing, and the deep snow, rendered it almost impossible for me to get to his aid, though the infuriated beast was striking at him violently. 'Get under the pulk (sledge),' I cried. It had been turned over. So he crawled under till the reindeer's passion was over. It was a scene worth witnessing, I can tell you.

Well, the cold was intense, especially one memorable night, when our hair, and beards, and eyelashes froze into such a compact mass that we thought our beauty must have been for ever spoiled. So severe was it, that though famishing with hunger, we dared not take off our fur-gloves, to get the food out of the provision-bag. I did do so on one occasion, to my great sorrow; for the cold had such an effect on my hand that it felt as if it was being pricked all over with pins and needles, and my fingers assumed a crooked form. As for our poor feet, they were literally without feeling; and to add to our miseries, both our noses got frozen. It had been agreed upon between us to keep guard over each other's noses, and directly we should see danger in the tip, to give timely notice thereof to the owner.

'Your nose is certainly bitten,' all at once ejaculated my companion in a tone which made me jump. 'See if you can feel it.'

'Deuce a bit,' I answered, as I jumped out of the pulk, and got a handful of snow, in which I bathed it and rubbed it gently till the pale tallowy look had disappeared, and animation had returned. But it soon came to my turn.

'Why, yours is frozen, I do declare,' I sang out.

'The devil—so it is!' and out jumped my friend, tumbling a header in the snow, thus giving nose and all the upper-works a complete snow-bath.

Yes, that was a cold night; and you, reader, will think the same when I tell you that the thermometer sunk to thirty-six degrees below zero Fahrenheit.

Stiff with cold, and starving with hunger, we reached the first Lapp encampment on the fifth day; we hailed it, need I say, with as much delight as if it had been a first-class hotel.

Those of my readers whose lot it has not been to visit a Lapp tent, might possibly like to have some idea about it and of its domestic economy. Imagine, then, some thirty poles, about one inch

and a half thick, set up aslant, so that their tops form a circle some two feet in diameter. Then round these poles imagine a thick covering, forming the sides and roof of the tent. The door is of the same material. The first thing that meets the eye, on peeping into this uninviting residence, is a pile of wood burning in the centre of the tent. If you enter, the next thing that meets it is the smoke, which at once suggests the expediency of assuming a devotional attitude, for it floats in the form of a thick ceiling, some few feet above the ground, on which alone the atmosphere is comparatively pure. The furniture is very homely, and the domestic arrangements of the most simple nature, and therefore readily described. The floor, which consists of fir-boughs and birch-twigs, is covered with reindeer and other skins, which serve as quilts or bolsters at night; some provision-bags form excellent pillows; and this, I think, is about all in respect to furniture. The ground, of course, is bed, chair, and table.

The people are divided into two sections round the fire; of which the one is composed of the ladies, the other, of the gentlemen. On entering, the stranger is very hospitably received, but particularly requested to leave the door, and close it after him as quickly as possible. He is then invited to seat himself by the ladies. After the usual compliments have been passed, and particular inquiries as to everybody's health in the tent been made, the coffee-pot is put in requisition. As a rule, the Lapps are very curious—I might say inquisitive. No wonder, therefore, that any one who has just left the civilised world is bombarded with all kinds of questions, which he must try and answer in the best way he can, while the host is cutting, or rather pulling, off a juicy reindeer steak.

Never did dish taste so grandly as that reindeer steak; and if the fire hadn't roasted one's face, and if one's back hadn't smarted with cold, I should have thought myself in Elysium, after the cold dreary journey we had taken.

At last, night came on (of course it had been night all day, for, as you will remember, the sun is too busy in other parts of the world at this season to shine in Lapland), or rather bedtime came on, bringing with it, of course, visions of a four-poster, white curtains, and an eider-down quilt, besides the snowy clean sheets. But where are they? Look well around you, and then make up your mind to make yourself as comfortable as you can, under existing circumstances, and don't mind the ladies. Pull your warm fur-cap down over your ears, and don't think of taking off your fur-cloak (mine never once came off from the time I left home till I returned to the Penates: dirty of me, perhaps; but very warm, my good friend, very warm!); pop your legs into a hay-bag, pull your gloves on, and cover yourself up with a skin, and then good-night, and God bless you. No doubt, you will freeze a little; probably, you won't sleep a wink; but never mind, you'll soon get used to it. The dogs—of which there were thirteen—kindly took a fancy to sleeping on my legs; and I'm sure I was very much obliged to them for keeping them so nice and warm, and I didn't mind the fleas!

From life inside, we will now pass to life out of doors. Generally, the tent is pitched on the margin of a lake, under the shelter of some large pine-trees. The site, in the present instance, was most

romantic; nature magnificent, but devoid of life; not even a bird was to be heard. Everything seemed not at home, and a deadly silence reigned supreme. No wonder, then, that the appearance of a live being is hailed with delight. Taking the census in the tent was soon ended, and now off to the reindeer herd. The Lapp on ski (snow-shoes), accompanied by his pack of dogs, plunges into the forest. The spectators—namely, myself and companion—were stationed on a place agreed on. All is still, till suddenly the barking of the dogs in the forest, accompanied by a crashing, rushing sound, affords a relief to the ear, and presently to the eye, for in a few minutes a sight is presented which many would gladly witness. Imagine the whole scene, which just before appeared so destitute of animal life, suddenly to become enlivened; imagine the graceful reindeer rushing in hundreds from all parts of the forest towards the lake, where they are headed by the dogs. These sagacious animals know each turn of their master's voice, and drive the herd to the appointed spot with the precision of a collie-dog. But the front rank press on to the lake, whereon the master again calls to the dogs, and makes them a signal; they understand it, and drive the deer back. At last, they are assembled in the desired place, and offer a sight I would not exchange for any tableau in the world. The Lapp then proceeds to divide them into two bodies, after which they are allowed a few moments' peace, and we begin taking the census. Generally, when the owner has thus got all his deer together, he may need one for domestic use; accordingly, he enters within the circle, and begins to examine the distinguishing ear-marks, till at last he has fixed on the animal he requires. And now stillness in the camp prevails no longer, for none of the reindeer have any particular wish to be lassoed. You hear a shrill whistling sound as the long rope uncoils itself through the air; the deer's horns are entangled in the lasso, and the rest of his companions retire, to leave him to his fate. Now the fun begins in real earnest. The Lapp at one end of a long line of fifty feet, and the reindeer at the other, afford two striking contrasts. The not very graceful movements of the former, which accompanied his exertions to keep a tight hold of his prey; and, on the other hand, the reindeer dancing a most charming minuet, more aerial than any ballet-dancer can execute, afford us the pleasure of witnessing a *pas de deux* which is as comic as it is graceful.

I will not weary my reader's patience by asking him to follow me on my journey from tent to tent, and from settlement to settlement; the journey might be as fatiguing to him as it was cold and unpleasant, I cannot say uninteresting, to us. In describing one tent and its occupants, I have described all. The reindeer herds are just the same; there is the same hospitable reception awaiting us—the same uncomfortable nights—the same frozen nose-tips! Rather, then, let me direct his attention to Fjeld-life in general, and to Lapp characteristics in particular.

The ease with which the reindeer makes its way through the masses of snow is wonderful. It seems scarcely credible that so small an animal can wade up to its belly in the snow, and yet be able to drag a pulk containing a good weight (I am fourteen stone without my boots) after it. Often my pulk would sink so deep that it was exactly as if one was passing through a snow-cutting, the

sides of which towered far above one's head. Often, too, it made me grieved to see what hard work it was for the poor patient beast, and yet how obediently it would obey the rein, attached to its left horn—how meekly it would receive a whacking, giving utterance perhaps to a grunt, while its tongue would hang down out of its mouth—a sure sign of distress. To say nothing of their numberless enemies in the summer, in the shape of all kinds of insects, and not to speak of their winter-foes, the wolves, it is often terribly hard work for them to find provender during this latter season; for the moss on which alone they feed is frequently at a depth of several feet below the surface of the snow, and this they have to scratch on one side, and bore a deep hole till they find it; and it frequently happens that when they have worked hard for a length of time, their mining operations prove fruitless, for there is no moss. But the young calves, how do they manage? They are not strong enough to scratch the snow aside, like the old ones; so they stand around, waiting for the pieces of moss to be scratched up, which the old deer in its burrowing scatters far and wide.

The Fjeld Lapps are fast diminishing in numbers, as are their reindeer herds; for instance, a man who, ten years ago, owned two thousand head of reindeer, has now not more than three hundred and fifty head left; consequently, poverty has begun to make its appearance among them, and with it the difficulty of existing only on the Fjelds. Numbers of them, accordingly, have moved nearer to the sea-coast, where the rich cod and herring fisheries furnish them with the means of subsistence.

The Fjeld Lapp has many more difficulties to struggle against than people are aware of, for it is only those who can talk their language, and who visit them in their abodes, that can form any adequate idea of their real circumstances. Though living generally on the borders of wild forest tracts, they have countless enemies to contend against. In summer, frequent are the quarrels among neighbouring settlements concerning the right of pasture; while in winter, there are the wolves to engross their attention. The havoc these brutes commit is inconceivable. In one winter, they killed a hundred and fifty head out of one herd. That same year, the same man lost three hundred other deer. They strayed across the Russian frontier, and were at once appropriated by the Russian Finns. But independently of these natural hardships, as we may term them, they have another and a no less pressing one to submit to. By the law of the country, they are bound to convey travellers certain stages. A man has often to send, or rather take his deer to the station whither he has been ordered, a hundred and fifty miles distant from his home, to convey a traveller a distance of forty miles. Accordingly, he has to travel altogether three hundred and eighty miles! It takes him about a fortnight, under the most favourable circumstances; but often, when the weather is bad, four weeks. And now for his remuneration. According to the fixed tariff, he receives two dollars for the journey, out of which he has to pay all his own expenses, and to find fodder for his deer; and thus he finds himself out of pocket some three or four dollars.

The powers of endurance of these hardy little people are as marvellous as are those of their reindeer, as the following well-authenticated anecdote

will, I think, shew. One May, a couple of Lapp families had encamped on a certain place, in order to superintend the calving of their hinds; but as the wolves proved troublesome, and would not leave the deer at peace, they deemed it best to shift their quarters to a place about a hundred miles off. But as some of the hinds had only recently calved, two half-grown girls were left behind, with a tent and provisions for a whole month, to see after them. When night drew on, the girls went to keep watch over their little herd, and, it seems, fell asleep. Little did they dream of what was about to happen.

Meanwhile, the father of the family, who had been absent for some weeks by the sea-side, and who therefore knew nothing about what had taken place, returned unexpectedly during the night; and finding the tent devoid of inmates, concluded that some calamity had happened, and had induced the family to shift their quarters, and that they had left tent and provisions behind, in case of his return. Little thinking that two of his olive branches were sleeping but a short distance off, he immediately set to work, and packed up everything, and started off in pursuit. The surprise of the poor girls on awaking can scarcely be imagined; but they suspected what had happened, so, instead of sitting down and crying about it, they started off, like sensible girls, on the trail, having first collected their little herd together. Thus they drove them, day and night, till, at last, on the morning of the eighth day, they reached the end of their journey. The long fast, and the exertion they had undergone—for they never stopped day or night, and had only one biscuit and some milk to subsist on all that time—made them very ill for a long time.

Now, that a Lapp can go without food for a protracted period, is as much a matter of fact as that he eats to repletion when he gets a chance. Eating with him is a business. I suppose he must have several stomachs, like the camel, or else that he is a ruminant animal, and chews the cud. A Lapp, by the way, eats but once in the twenty-four hours, but then he lays in enough for six days.

Generally speaking, the Lapps are a very religious, and frequently very fanatical people. One Saturday, I remember we arrived at an encampment, and after we had talked on all manner of topics, one of the party urgently begged us to stay the Sunday over, and hold prayers for them and the neighbouring families. Though but little used to that sort of thing, we of course complied. Indeed, so eager did the poor people seem to attend at the service, that one man who was obliged to keep guard that night over the rein-flocks, begged us not to begin till he should be able to get back from his post next morning—some nine or ten miles distant. Sunday came, and with it the watcher; and my companion, who could speak the language fluently, filled the priestly office; and I can confidently aver that, in the midst of those desert wilds, I listened to the best sermon I ever heard in my life. It was earnest, to the point, and short! What more can be desired?

Both on our return, and on our journey out, I had on several occasions been struck with the extraordinary acuteness the Lapps possess in finding their road in the dark. One day especially I remember; we were on the bare Fjeld, when a violent snow-storm overtook us. The wind whistled, and the flakes of snow pelted in our faces, so that it was impossible to see a handbreadth in advance. Of

course, we left it to our guide to steer. They say that dogs possess the faculty of being able to smell out their way in the dark, and I certainly think our Lapp must have made use of his olfactory organs on the present occasion, for I cannot conceive which of his other senses he could have employed; he managed to hit off the only pass there was down into the valley with the utmost ease and certainty. Only on two occasions did he seem at a loss, and then but for a moment, and on we dashed again, faster than ever, to the great disgust of the deer, who seemed to approve of the pelting snow as little as the travellers behind them. While I was calculating on the contingency of our having to be out all night in the open, and wondering whether we should not be quite snowed up by the morning, a sudden bound awoke me from my reverie, the pulk seemed to fall down suddenly several feet, and the next moment we found ourselves in comparative quiet in the valley below. It was still here, and there was no snow pelting in our faces; but we could hear the wind howling above our heads, as if in wrathful ire that we had escaped it.

Now for the first time I was able to speak to our guide, and express my admiration at the sagacity he had displayed.

'If I could not find my way,' he replied in a proud tone, 'I should be unworthy the name of a Fjeld Lapp.' And he was right; for if these people do not possess many other good qualities, certainly in the matter of finding their road in the dark they are unsurpassed.

It was better travelling now; and late in the evening we reached a humble dwelling belonging to a family of the Skolte Finns. It was a wooded structure without a roof, and only covered above by a few thin boards, through which light, rain, and wind could easily penetrate. I think a brief description of these strange people may be interesting. The Skolte Finns are a cross between the Lapps and the Russian Finns, a sort of bastard Lapp, if such a term can be applied to a human being; neither fish nor fowl, speaking neither Russian nor Finnish, in fact, no language at all. They are a very peculiar people; acknowledging outwardly the Greek-Catholic religion, but in reality, like many other people, observing none.

The family in question consisted of a man, his wife, two sons, and two daughters, all of whom were originals. Their dress was a comic medley of Russian and Lappish attire; only the head-dress was peculiar to the tribe. The old wife was a regular harriidan, and scolded, I dare say swore, like a Turk; and was highly indignant with us for presuming to drink out of her water-vessel, and for lighting our pipes. She considered it sinful!

But the filth and the accompanying stench rendered a little tobacco a necessity, so we continued to puff away, as if we did not understand what she meant. I will not speak of the insects that swarmed in myriads; suffice it to say, that this was doubtless the head-quarters of all the B-flats in the country.

I know there is a fish that is cooked with its *inwards* in—the red mullet, I think; the woodcock of the sea; but that, I believe, is the only fish that will bear such treatment. These people, however, seemed to think differently, for they cooked their fish, a kind of cod, whole. 'It makes the soup stronger,' they said! Supper over, which consisted of the above fish boiled with its internals, the whole family began to bow and to cross them-

selves, that is, to manœuvre with the forefinger from the forehead down to the stomach, and then transversely from shoulder to shoulder; giving utterance meanwhile to several strange sounds, which might have been prayers, but resembled hiccoughs! And indeed I am inclined to think it was more a matter of form than of devotion; for in the middle of it two of the children grabbed hold of a fish, and began to fight over it, whereon their mother stopped short in her religious exercise, and most emphatically punched their heads! After grace, or whatever it be termed, we were witnesses to a scene I have never seen before, and trust I may never see repeated. It was a washing-scene. I suppose they considered that washing belonged to the luxuries of life, and therefore adopted a simpler but very ingenious method of performing their ablutions. First, they filled their mouths with water, which they spat out again into the hollow of their hands, and then commenced scrubbing away at their begrimed faces; the result of which was, that, after repeated applications, a whity-brown patch gradually made its appearance in the middle of the face, looking like a dirty blotch set in a black frame.

We passed a most uncomfortable night on the floor, and left a great portion of ourselves behind, for we were almost devoured (but let me be silent; the mere remembrance of it educes a scratching tendency); we were glad when morning came, and it was time to leave the roof of this distinguished family.

Learning that there were some Quæn settlements on our road, we determined to pay them a visit. In one of their huts, we found an old man of seventy years of age. He looked as dirty and as filthy as the rest of them; but still there was an air about him that proclaimed that he had seen better days. He walked up to us, and shook us by the hand, addressing us in pure Swedish. After having described to him our journey, its haps and mishaps, he again astonished us by speaking in the Latin tongue. Imagine Latin being talked in the wilds of Finmarken! My friend excused himself from participating in the conversation by avowing his entire ignorance of that tongue; but I, who had once learned it at school, thought it *infra dig.* not to pay him back in the same coin. To ransack my stock of Latin words was easily done, for alas! I could not find above ten.

'*Latine loqueris, Domine!*' he began.

'*Etiam, Domine!*' And I could get no further. Indeed, the only course open to me was either to follow the plan Holberg makes a worthy dean adopt, who, when he found himself at a loss in Latin conversation, took refuge in declining *Musa* aloud, to the bewilderment of his listeners; or else to beat a retreat. I adopted the latter course, and we conversed in Swedish and in German for the rest of the time. Our host, he told us, had formerly been a student in theology at the Russian university of Helsingfors; but his father having died, and misfortunes overtaking him, he had been compelled to relinquish the idea of entering orders; and at length, after undergoing several vicissitudes, had pitched his tent in the remote wilds, where he hoped to remain till he died. It made one feel sad to see a well-educated man thus cut off from contact with the civilised world, and buried among the fields and snow of the Finmark wilds. But we had no time to stay and commiserate with him, but, bidding him adieu, pushed on towards home.

After fourteen days' and nights' hard travelling, we reached the Penates once more, glad to be able at last to change our clothes; happy to be able to sit down to a clean and comfortable meal, and charmed above all to turn in between clean sheets, and dream till far on in the next day about reindeer minuets, Latin-speaking Quæns, and the ablutions of Skolte Finns.

THE INTEREST OF A SHILLING. IN SIX CHAPTERS.

CHAPTER I.—CATCHING THE OMNIBUS.

'In five minutes I must be off, Grace, dear,' said Mr Hargrave.

'What! without kissing baby? O fie, Ned! cruel Ned!' said his pretty young wife, darting up-stairs for the unconscious cherub.

Mr Hargrave, cashier in the well-known bank of Messrs Brettles, Crevasse, and Glashier, Fenchurch Street, put on his hat, and took up his neat gloves and trim umbrella, and opened the front-door of his little cottage in Elm Tree Road, Holloway, and by so doing let into the narrow hall an irresistible flood of sunshine, that instantly covered the smart new oil-cloth with a sheet of leaf-gold that eclipsed all its garish colours.

There were few happier men in Holloway, that pleasant June morning, than the young husband standing on his snowy-white door-step, waiting to kiss his child before he started to business, and the care and fret of a long day in the city. The custard-coloured and great purple roses blooming over the doorway were waving gently and proudly in the sunshine; the canary sang hilariously in the parlour; baby crowed from the bedroom; Betty, the fat little maid-of-all-work, sang a country ditty in the kitchen. Far down the road, there sounds that pleasant suburban cry—so musical, so well-cadenced, so full of summer reminiscences—'Any ornaments for your fire-stoves?' A glimpse of the vender's banners, of coloured paper, could be caught round the corner by the baker's. The other way, towards Highgate, came a large open truck, full of flowering geraniums, propelled by a hearty, cheery, young costermonger, who was offering a laughing servant-girl at a lilac-shadowed garden-gate, 'Any one you like for an old hat, my dear.' The gracious warmth and gaiety of summer pervaded the air. The distant roll of the Highgate omnibuses, sweeping down towards London, came upon the ear with a pleasant sense of animation. The great city was awaking to its toil; the upper-crust workmen were hurrying gaily to their work.

'Now then, Grace—now then, quick's the word,' said Mr Hargrave reproachfully; 'not another moment.' Stern despot, and not two years married.

'Here's pet, you cruel, impatient tyrant,' said the smiling young wife, as she placed the baby in her husband's arms.

As Mr Hargrave stooped to kiss it, a great purple rose let fall a shower of leaves upon his hat, and one of them fluttered down upon the little rosy face of baby. The blue eyes, so like those of the

mother, laughed, and the tiny hands stretched out to seize the leaf.

'Dear little pet!' said the mother, showering kisses on it, as she took it back into her arms.—'Do you know, Ned,' she said—'it is very foolish, but I never see you come home of an evening but I fancy you'll run in and surprise me by telling me all at once that you have been made a partner.'

'Very likely, Grace, you little goose, you.'

'Well, there have been more unlikely things, Ned. They all like you very much.—I do hope that's not true what the paper said yesterday about a panic coming. Oh, how dreadful that would be! Suppose anything happened to Messrs Brettles, Crevasse, and Glashier.'

'Don't let foolish people's talk get into your silly head. There's no panic coming. With honesty and prudence, there'll be no run on any one—a little alarm, perhaps, but soon over. Your own little silly head runs alternately on partnerships and panics. Old Mrs Grandsham again, I suppose—chattering, spiteful old woman; why do you listen to her?'

'Well, Ned, don't be angry. I don't listen to her; but how can I help being alarmed when she tells me every one is afraid there will be a panic?'

'Stuff and nonsense about a panic. Our house is firm as St Paul's. I never saw our partners look so cheerful as yesterday, when the silly rumour was about. But there's that rotten concern of Shatterton and Gilberts; they're rather rickety, but then they have been so for five years.—Good-bye, dear—I shall be late. Good-bye. Don't you trouble yourself now, mind, with City matters.'

'There is no fear,' said his wife to herself, as the garden-gate slammed after him. 'Ned is all truth. No; there is not a shadow on his face. Then all that Mrs Grandsham told me was nonsense—perhaps said to vex me.' And she tossed her baby in the air, till it shook down a bunch of roses, and crowed with delight.

CHAPTER II.—THE SHABBY-GENTEEL MAN.

Hargrave had walked about a mile along the road, when the Highgate omnibus came racing behind him—harness rattling, whip cracking gaily, driver hailing cheerily every one he passed: 'Islington, City Road, Bank, Fenchurch Street.' He was a jovial driver; and as for the conductor, he was a wit.

The omnibus stopped for Hargrave.

'Sorry, Mustur Hargrave, we couldn't keep your seat this morning nohow,' said the driver, touching his hat. 'Sporting friend of mine going up.'

Hargrave said it was no matter at all, in a pleasant, hearty way, and got inside. He was one of those good-natured, agreeable men that nothing ruffles. He was happy, and determined to be pleased. The sunshine did not scorch him; it was just warm enough; the air was pleasant. The loss of the box-seat—that was indifferent. The smallest things amused him: boys going to school and skrimishing with their bags of books; servant-girls coquetting with the tradesmen's emissaries; old gentlemen driving in to business; haymakers resting at roadside public-houses; children dancing round a laughing organ-man—passed like snatches of a pleasant panorama before his eyes. There was no anxiety, no feverish greediness about him. He

was not a slave of Mammon at all; his idols were Independence and Domestic Love. He was a happy, honest man, who tried to do his duty in life, and earn a competence in a reasonable time. The usual average of people got in and out: a fat, anxious, hot-faced woman, with a bundle tied up in a handkerchief, and a hand-basket; a sailor-boy, a farmer, two city clerks, an old maid with wiry ringlets and a roll of music, a ruefully poor woman, a drawing-master, and a baby.

A quarter of a mile before the *Angel*, a tall, thin, old gentleman, shabby-genteel in dress, and remarkable for a queer brown spencer (an impoverished sort of old-fashioned garment at the best of times), beneath which depended two lank, rusty, black-coat tails, hailed the omnibus by raising silently in the air a large faded umbrella, and got in.

The conductor winked, as he approached, to Hargrave, who sat near the door.

'Here comes one of your reglar old begging-letter impostors,' he said. 'They always try to do the clerical dodge. I know 'em.—Here, come along,' he shouted; 'we can't wait about all day. Look alive, old gentleman.—My eyes, wouldn't he do to let out as a scarecrow! His wittles don't cost much. He'd do for the apothecary without starving—he would.'

The other passengers laughed. Jokes against poverty and leanness are always telling. The fat man enjoyed it; the old maid, who had just been paid for a quarter, smiled, after her manner; the farmer, rejoicing in many beeves, chuckled selfishly. Hargrave alone looked at the new arrival with rather pity than ridicule.

Old age alone is bad enough; but sickly and impoverished, it is worthy of all tenderness. Youth is the time when we can best bear the rain and the storm—the loss of those we love—the cruel grave, opening for its victim, and closing up on it while we pray in vain—the disappointments of friendship, and the gathering of bitter experiences; the time to reap the thorns we sowed, and drink the gall we have brewed for ourselves. Age should bask calmly in the afterglow of twilight; and, solaced, cherished, indulged, forgiven, sit with folded hands, waiting for the inevitable but silent blow. A disconsolate, childless, sordid old age, racked with sickness, tormented with poverty, and uncheered by love, is surely one of the saddest sights in this earth of ours.

So thought Hargrave—by no means an unreflective man—as the new-comer arranged a treaty of knees with him, and sat down by the door, facing him deprecatingly, with his long poddy black gloves on the top of the yellow ivory knob of his seedy umbrella. His tight threadbare trousers were greasy at the knees, and scarcely contrived to reach to the pinched drab gaiters that partly covered the old wrinkled boots. His hat was of a bygone fashion, and half-covered with coarse dusty crape. The very ribbon of his watch was grimy, and betrayed poverty. The old gentleman in the spencer had a long, pale, but not unpleasant face; a long, thin, prominent nose, small lips, a long chin, and scant gray whiskers; yet the expression was good, and the eyes had a depth in them that could not be overlooked. The old gentleman in the spencer might be poor, but he was certainly no beggar; he might be a low bill-discounter, but he was no man to be insulted or patronised.

With the kindly feeling with which old age

looks back and sees in bright vigorous youth its own past, the shabby-genteel man eyed Hargrave from time to time. There were indeed worse faces than that calm bright one before him, crowned with a luxuriance of wavy brown hair. The large brown eyes were so manful, and so frank and unsuspecting in their expression; the mouth so firm without sternness; the whole bearing of the man so self-reliant, without being contemptuous or insolent. There was no guile possible in such a man. Yet the feeling in seeing him was that he was not a man to be trifled with either. Presently they began to talk. The old gentleman in the spencer asked Mr Hargrave if he was a business-man—had partly guessed he was. Was there any chance of the long-dreaded panic coming? Was it not pretty nearly sure that some of the old houses were tottering? Was there any fear of (say) Brettles, Crevasse, and Glashier? Of course it was all up with Shatterton and Gilberts.

The old gentleman did not speak like an alarmist; but still he evidently had fears. He did not talk like one who felt much interest in the question. Alas! those rubbed elbows and those worn knees were not the signs of a man who had much to lose. His pale eyes grew a little more firm, and the pupils a little darker and larger, as he leaned on that old companion, the umbrella, and waited, with one thin hand scooped up towards his left ear (the omnibus rumbled so), for Hargrave's answers.

Hargrave replied with careless buoyancy (for he hardly relished being catechised by a rather doubtful stranger); but the quiet, unobtrusive manner of the old man rather won upon him, and he condescended to answer categorically. He derided all idea of a panic—rumours spread abroad by interested persons. He knew of no old house that was tottering. It mattered little to any one but Gilberts and Shatterton what became of Shatterton and Gilberts. From his own experience (here he looked rather angry, and his brow contracted)—being, he was proud to say, cashier of Messrs Brettles, Crevasse, and Glashier—he could affirm that never had that firmly established house been more triumphantly prosperous, more certain to ride through the worst storm that could blow up for mischief. He would scarcely be believed if he mentioned the amount to which the securities then in their safes had reached.

The old gentleman looked down, and pinched a tube of straw under the bulging ferule of his umbrella; and when he looked up, a rueful smile just raised the corners of his lips.

'You are sanguine,' he said: 'young men should be. I suppose I was once. May you be right. God trust you are so; but I doubt. I never saw swallows fly low unless rain was near. The bears are about and growling.'

'But it is so. It is my business, sir, to know that it is so.'

'You are young and happy; you see things as you wish to see them. I know the signs of bad weather too well. Glass bottles are brittle as they used to be, and brittle things will break.'

The old gentleman laid a certain emphasis on the word *brittle* the first time, and infused a certain acidity into it the second, that rather nettled the young man.

'If you mean a bad pun on the name of one of the partners of our house,' he said, effervescing, 'I say it was an impertinent thing, and'—

'Your fares, gentlemen, if you please,' said a

rough voice at the door. The omnibus had stopped at the entrance to a stable-yard in Fenchurch Street; it had reached its destination.

The old gentleman was first and nearest the door, and he pulled off a long podded black glove with his teeth, and proceeded to get his purse from his right-hand trousers-pocket: it was not there; in his left—it was not there either; in his spencer breast-pocket—no; in his waistcoat—no; in his tail-pocket—right—no; in his left tail-pocket—no. A slight pink flush came on his cheek-bones—his lips grew dry with ill-concealed nervousness. He looked uneasily round, and then on the cushion behind where he sat.

'It's very odd,' he said—'very careless of me—dear me, how very careless—but I'm really afraid I've left my purse at home.'

'Now then, sir; don't keep the gents all day,' said the conductor, clashing his pocketful of pence spitefully.

'I really don't know what to do. Suppose I leave it till to-morrow, conductor?'

'Oh, that's your little game, is it, you old duffer?' said the conductor with insolent violence. 'O no; you don't get the pull over me in that way. You pay, or I'll have you up, right off. Come, where's your money? Pay up.'

The old gentleman buttoned his spencer together, and looked round. A crowd began to collect; some street-boys began to shout and practise bird-calls and thieves' whistles.

'Jack, here's a row—here's an old gent's cheek-
ing Fighting Jo. Wire in.'

One good-natured old woman called for the police, and of course the more she called, the more the police did not come.

'Come, come, sir, pay the man,' said the other impatient people, trying to jostle out of that long cave of an omnibus, the entrance to which was impeded by that troublesome old cheat (as some one called him).

'Pay like a man!' shouted the boys.

'Can any gentleman oblige me with sixpence?' said the old man (now palpably a mere Joseph Adey), turning round nervously with calm entreaty. 'I've left my purse in another coat, and I do not wish to incur any more of this vulgar fellow's insolence.—Most careless of me; a most unpleasant thing; but I have no remedy, for I won't trust my watch with such a low fellow as this. It would only encourage him in such conduct.—Will no one oblige me?'

The other passengers looked cross, or blank, or insolently amused, but not one produced the solicited sixpence.

'Call the perlice!' shouted the conductor. 'I'll have it out of him. Strike me silly, if I don't have it out of him in half an hour, if there's justice at the Mansion-us. Old scoundrel!'

A feeling of pity came over Hargrave as he stood watching the scene. Half ashamed of himself at being, perhaps, after all the mere victim of an old trick, he handed the old man a shilling, and begged to relieve him from the accidental annoyance. One or two of the passengers laughed, and winked at the crowd.

The old man in the spencer, cheat as he might be, behaved with all the conventions of a gentleman: he lifted his well-worn hat, and bowed to Hargrave as he took the shilling; then he handed it to the conductor, who had thrust his tongue into his cheek, and was shouting to the driver.

'My last ride with you, my man,' he said.

'Don't want to see you again, for you are not our sort at all,' retorted Fighting Jo, giving him the change.

'I have to thank you, sir,' said the old man, as he walked for a moment at Hargrave's side, 'for shewing some confidence in poor human nature. Sir, I thank you extremely. It was the act of a gentleman, and a good heart prompted it. I will not insult you by asking you where I shall return the shilling. Good-morning, sir; and may your hopes about business affairs prove all my fears to be fallacious. I wish you a very good-morning, sir; and once more thank you.'

'What a tongue the old fellow has, and perhaps does the same thing almost every day. Well, I suppose it is a wicked city, this London,' thought Hargrave to himself, as the old gentleman in the spencer walked rapidly back northward.

CHAPTER III.—GLASS BOTTLES ARE STILL BRITTLE.

The rumour of the panic proved too true. A friend with his cheque-book chained to his waist, told Hargrave, in a moment's nervous conversation at the door of Messrs Brettles, Crevasse, and Glashier, that several houses were in danger, and that there was a run on Shatterton and Gilberts. He had hardly been able himself to get past the crowds round the door of Thawton, Meltnore, and Droppets. Bad news from France—America, nasty—everything going to the bad—meet at dinner-time, but perhaps no dinner-time—governor cut up root and branch—afraid of ruin.

Hargrave hurried in. His fellow-clerks were silent, and they looked pale and anxious. A little sour yellow fellow, named Cross, a clever accountant, darted across the counter, and button-holed him. 'Shatterton's all in a hole,' he said; 'egad, sir, he's in a hole. Governor wants you directly in the parlour. It's U. P. with Shatterton. I think, from what I hear, they're hard hit; but it won't hurt us much, eh? I hope we ain't hit hard; we shan't suffer?'

'Not a ha'p'orth: we're sound enough,' said Hargrave, flinging open his gray summer-coat in a way that would have given the most frightened investor comfort. 'You know we wouldn't mix ourselves up with that frothy lot, though old Shatterton begged us almost on his knees—old swindler!'

Hargrave was a generous, kindly-judging fellow, and not a bit of a Pharisee; but then Shatterton was such a plausible rascal, such an infamous, lying bubble-monger, and he traded, as every one knew, on the ruin of unsuspecting and thrifty people.

In the parlour, with a letter-weight, the red Alps of the Post-office Directory, an ink-stand, and an envelope-box before them, sat the triumvirate, Messrs Brettles, Crevasse, and Glashier.

Mr Brettles was a port-wine fed, jolly man of the old school, with large white whiskers, a red face, and a white waistcoat. He represented the social *bon-vivant* humbug. Mr Crevasse was a thin wiry man, with a high, checkered neckcloth, and large, sharp, erect collars, strapped boots, and watch-seals. He was the respectable and philanthropic humbug. Mr Glashier was a dark, sharp-looking, clean-shaven man, austere, severe—plain dressed, and remarkable for gold spectacles. He was the keen commercial humbug.

'Good-morning, Mr Hargrave. D. V., a blessed morning indeed,' said the lover of mankind.

'How de do?' said Bibulus gaily—'how de do?'

'We have some business to talk over, of importance, great importance; sit down,' said the curt Cato of commercial enterprise. 'Be seated.'

Hargrave was seated.

'A gracious Providence,' said Cato, drawing up his neck stiffly in a Dombeyish manner—cold, precise, and pharisaical, and putting the fingers of both hands together, as if to match them, 'has so ordered it that a run seems imminent. A gracious'—

'The long and the short, Mr Hargrave, is,' broke in Bibulus, 'not to put too fine a point on it, that unknown to you, we have long been entangled with that infernal beast Shatterton, and now we're going to catch it hot.'

'We want time, nothing but time. Every moment,' said Glashier, 'is worth a hundred pounds. Delay, and we float over this crisis.'

'I'll sell two hours of mine, and glad to do it,' laughed Bibulus, coughing apologetically at his own immense drollery. 'But just look at Hargrave; he's struck all of a heap.'

'Brettles, these expressions are flippant and unbusiness-like,' said Glashier. 'Our cashier is distressed and surprised. I was distressed and surprised—wasn't I?'

'Brettles, be a Christian first, and a banker afterwards,' said Crevasse.

'Can't be done at once, I suppose? Well, I like that. Come, how do we stand? Shew Hargrave himself how we stand: let him know the worst.'

'There's only one man, I tell you, can help us, and that's old Brownsmith of Fore Street; he'd set our colours flying again—but catch him.'

Misfortune had made Bibulus rather jovial and familiar with his cashier; he had been insolent and purse-proud enough a day or two before. He and his partners relied on Hargrave to save them from bankruptcy.

Long was the discussion—patient the investigation—manifold the comparisons—much brown sherry drank Bibulus—many texts quoted Crevasse—many axioms propounded Cato, *alias* Glashier—Hargrave worked silently, but like a dragon; but one result was eliminated from all—Ruin; hopeless, crushing ruin. The wind had been sown, and the reaping of the whirlwind was at hand.

CHAPTER IV.—THE SPENCER AGAIN.

'But Ned, dear, why didn't you tell them you were sure there was some concealment—something dishonest; that ruin must come, if all was not honest and fair? Dear Ned—you so bold and so brave—how could you let those bad men think they were deceiving you, when you found they had altered the books? O Ned, dear Ned, it was not like your own brave self.—Hark! at baby crowing!'

Hargrave and his wife sat together at the open window of the little cottage at Holloway, hidden from the road by a great laburnum, that streamed over the little plot of lawn with golden cascades of bright linked blossom.

He looked worn and sad—how different from the bright morning of a day before—and Grace had her arms round his neck, and her hands clasped upon his left shoulder.

Down fell a batch of purple rose-leaves from the wall above on the window-sill—so had fallen his

hopes. He had lost confidence in mankind. He had found the three men he had so respected, to be little better than rogues. But how pure, and gentle, and loving the young wife looked, as she soothed and comforted him, and bade him look up to the only source of real comfort.

Hargrave answered, after a long pause.

'Grace, dear,' he said, 'you know that I could not swerve from truth and honour; but when I thought of our dear home, and all we might have to surrender, my heart seemed to melt away till no grain of it was left. What could I say? My very brain refused to answer the helm. I seemed a mere living automaton; and I added figures and wrote almost without knowing what I did. It was not for me to stand up and reproach these dishonest schemers. I thought— But who's that at our gate? He looks— Why, he's actually stopping and looking at us.'

'It isn't Uncle Arthur,' said Grace. 'Why, it's an old gentleman in a spencer, Ned. Oh, what a queer creature! He's coming in.'

'Why, it's the very man, I declare, whom I lent sixpence to, on Monday, to pay his omnibus. How did he find me out? Come, Grace; there's one more honest man in the world!'

Yes, the same bad hat, same scanty spencer, same gloves, same dusty-brown cotton umbrella. There he stood, eyeing the pair, as if the domestic picture pleased him, and he was really quite loath to break the grouping. In a moment more, he lifted the latch of the gate, and walked on the paved walk, and ascended the steps of the front-door, lifting his hat as he approached the window, and met Grace's wondering eyes.

'Evidently a gentleman,' said the care-worn man to himself; 'but still I wish he wouldn't come bothering here. Perhaps it is some trick, after all. I suspect everybody now.'

At that moment, Betsy ushered in the old gentleman, not cringing now or nervous, but observant and at his ease.

'Good-evening, madam; good-evening, sir,' he said, bowing first to Grace, and then to her husband. 'I hope, I'm sure, that I'm not intruding upon you; but I have come to pay a small debt.'

He drew a shilling from his glove, and put it quietly on the table as he said this. Hargrave pushed it back rather contemptuously. It was annoying to have a man exaggerate a small kindness into a positive loan.

The old gentleman smiled blandly. 'Take it up, young man,' he said. 'A shilling is, after all, twelve pence. It may be a truism, but still a shilling is not at all to be despised, especially in these times.'

'Here is a character,' thought Hargrave, offering him a chair politely. After all, why be offended by honest eccentricity? It was a way, though an odd way, of acknowledging a kindness.

'And may I ask you how you found out my address?' said the young City-man.

'By the simplest way possible: you told me your bank. Passing yesterday, as the doors were closing, I asked the man who was sweeping the passage—I do not live very far from here—up at Highgate—and so I thought I'd call, and in person return the sum you so kindly and unsuspiciously lent me. The kindness I will, at all events, answer for.'

'What a polite old gentleman,' thought Grace. 'I am sure I should have done as Ned did.'

'And now, having intruded,' said the mysterious old gentleman, 'may I ask, Mr—Mr'—

'Hargrave.'

'Thank you—yes, Hargrave, whether you did not find my fears only too well founded? Yes, I can see you did. I need not conceal from you that I have been a banker myself, and am still much in the City. I do not require you to tell me that Brettles, Crevasse, and Glashier are in a bad way, for I know it from the highest sources.'

Hargrave started.

'Yes, I do occasionally learn secrets. There is but one way to retrieve these men, and that is by a way they will never adopt—Honesty.'

Hargrave started to his feet, indignant at this impertinent intrusion into his private affairs.

'Sir,' he said, 'whoever you may be, or whatever you may be, I will not allow any one to come into my house to slander my employers.'

'Ned, Ned!' said Grace reprovingly.

'Your zeal I admire,' said the stranger; 'I can only lament that it is expended on such men. I tell you, circumstances have revealed their true position to me; I know it as well now as if their books lay open here upon the table. I have come here to-night as a friend—not to them, but to you—to give you the benefit of fifty years' experience. I can save the bank for a week—longer, if Honesty is tried; but even if it is not, for one week. Tomorrow, there will be a run; I tell you there will—you fear it yourself.'

A strange feeling seemed to come over Hargrave as he looked and saw his wife's eyes fixed beseechingly upon the mysterious stranger—the magician who seemed to read his mind, and have power to direct events.

'I see you know all,' said Hargrave, resuming his seat, and resting his head between his hands. 'Yes, time—time is what we want—time till we can prove our resources, and borrow from some great capitalist.'

'Whose address is permanently—Bedlam. Tush! I can give you time; but the bank has, I fear, no real roots—it must go.'

'Oh, don't say so!' cried Grace, wringing her little hands, as if the man in the spencer had been Rhadamanthus himself, and she the suppliant Proserpine.

'I will listen to your advice,' said Hargrave, with a sudden recurrence of distrust; 'but I will not reveal any inkling of the secrets of our firm. I have allowed, in a moment of excitement, that we are anxiously awaiting events—you will not betray my confidence. You say there will be a run; we shall meet it. To-night, a loan may have been effected with Mr Brownsmith of Fore Street.'

'Do not trust to it; trust to stratagem, as I did three times, when I had a bank in Exeter. As a young man, I have often been sent to London for boxes of guineas, and come back with them under the seat of the mail-coach. Sir, I have a dozen stratagems to restore public confidence, and disarm foolish fears. The run to-morrow will be slight: you can meet it; that will give you time to adopt my plans, if you like them, and avert the crisis of the day after.—But mind, Mrs Hargrave, that I tell your worthy husband that I can tie flowers to sticks, as children do, but I cannot make the rootless flowers grow. If the firm is dishonest, down it will go, in spite of a thousand artifices like mine.'

Just at this moment the door opened, and in came Betsy with baby, chuckling and struggling in

her arms. Betsy stepped back alarmed when she saw the stranger.

'Pray, come in, nurse,' he said; 'I and your husband, Mrs Hargrave, can talk over our business notwithstanding.'

Poor Mrs Hargrave would not hear of it, and marched off in procession to the drawing-room.

CHAPTER V.—THE RUN.

'Well, I never heard a grosser calumny,' said one City-man to another at the door of Messrs Brettles, Crevasse, and Glashier. 'They talked as if the whole firm was on its last legs, and yet I never saw so much gold behind a counter in my life! Did you see those kegs of sovereigns they kept unloading? Several fellows refused to draw at all.'

'Yes; and did you see those swells come in for their eight and ten thousand each, and have it out in gold? Oh, they're sound enough. Why, I saw a country gentleman draw four thousand pounds.'

Even City-men are fallible. The kegs of sovereigns had only layers of gold upon false trays; and two-thirds of the swells and country gentlemen had been friends of the clerks, persons paid to personate the characters, and receive at one side of the building, to pay back at the other.

The moment the doors fairly closed, Cross rushed to congratulate Hargrave, and a volley of laughter ran round the building. 'The run is over,' said the atrabilious clerk; 'thanks to you, Hargrave. By Jove, sir, if they don't give you a partnership, they ought to be shot! You've saved them, by Jove! And what a lark! I could hardly keep my countenance when the spree began. And how slow we doled it out to 'em. By Jove, it was a caution! Fancy Jones's brother, Sir Thomas Byng, and such a blue tie! Oh, I shall kill myself laughing.—Hollo, look; there's the governor calling.'

The three directors received Hargrave in triumph. Mr Brettles drank his health in brown sherry, with all the honours, and a convivial speech; Mr Crevasse raised his eyes to the ceiling in mute thankfulness; Mr Glashier hinted mysteriously at a partnership.

'Now, look here, gentlemen,' said Brettles, turning round upon them with his jovial face, and with his thumb in the arm-holes of his white waistcoat; 'this won't do, you know—this really won't do; I'm very, very sure it won't do. Hargrave here has saved our firm—restored our credit. Brownsmith is certain to come forward now. Hargrave must have a partnership before the year's out.'

'Providence has clearly marked out our course,' said Mr Crevasse with a groan, as if Providence had hurt him—'marked it out.'

'It is a simple business-like return,' said Glashier, coughing as if the words had a reluctance to come forth; 'mere return for goods actually received.—Not even necessary to thank us, is it, Brettles?'

'Certainly not; by Jove, no!' said Brettles pompously.

Hargrave's honest face glowed with pleasure, his eyes were touched with gratitude. He thanked the directors for their generosity. 'The most remarkable thing, gentlemen,' he said, 'is, that the plan I adopted, and which turned out so successfully, was suggested to me by an old gentleman, poorly dressed, I met in an omnibus, and to whom I

lent a shilling to pay his fare with, as he had left his purse at home.'

'Capital, capital!' shouted Brettles. 'By Jove, look at that!'

'Perhaps an angel unawares,' said Crevasse, improving the occasion.

'This day-year, Mr Hargrave, you are a partner in our firm; it is the least we can do,' said Glashier.

That night was a joyful one at the little cottage at Holloway, and Grace shed tears of joy when Ned told baby in his funny way that he was son of a partner-elect in the great firm of Brettles, Crevasse, and Glashier of Fenchurch Street.

'Ned, dear, that was a well-spent shilling,' said Grace, as she kissed him on the forehead, and sat down to tell her joy to the piano in some rejoicing music. Mrs Grandsham had been wrong after all. She had been prophesying terrible things lately.

CHAPTER VI.—BROWNSMITH.

A week from that day, Hargrave took a day's holiday. He had promised to take Grace to the Academy, and she and baby were to go to the City, on their way westward to the photographer. It was a glorious morning—sky miraculously blue, pleasant breeze, and hot sun. Costermongers, with flowering geraniums on their heads, that waved like plumes, walked down the City Road, shouting their prices like war-cries. Great brimming wagon-loads of hay, speckled with dead flowers, that, a few days before, had been floating upward in country meadows like the specks of gold-leaf in Danzig water. Hargrave and Grace were in high spirits; and as for baby, who followed behind in Betsy's arms, she had to be repeatedly called to order for making furtive snatches at passing bonnet-ribbons, and crowing too uproariously. Just before they turned the corner of Fenchurch Street facing the bank, Grace said: 'Ned, dear, do let us go past the bank. I want to go and fancy myself coming for you in my open carriage.'

Hargrave laughed, and Grace tripped round the corner laughing.

The bank was now in sight. Gracious Heaven! the shutters were up, the doors closed, and a crowd collecting. No wonder he turned pale, as Grace clutched his arm. They both stood fixed like statues. At that moment, the door opened, and out darted Cross, sharp and alert. He had a square sheet of paper in his hand, and this he rapidly wafered up on the shutters. There was a groan and hiss from the crowd. It announced the closing of the bank. It had gone at last. Honesty had not been tried, or if it had been tried, too late. Every moment, widows and distressed-looking depositors began to collect round the door. The crowd stood gaping, as if it really expected to see the house split in two, or the three directors simultaneously throw themselves out of window. It was quite a sight for the street-boys to behold persons who had actually put money into a bank, and lost it.

With an exclamation of surprise and horror rapidly exchanged, Hargrave and his wife darted across the street, and in a moment were in the bank, just as Cross was about to close it.

'What is this, Cross?' he said. 'I must see the directors. Take care of my wife, while I go and confront these men. There has been fraud here. I have been giving my aid to deception. I will tell them so; I will'—

Cross seized his arm, and several other clerks crowded around him expostulating. 'Not yet,' they said; 'you can't go. Brownsmith is in there with them, and no one must disturb them.'

They all stood looking awe-struck at the glass-door that hid the great unshaken capitalist. 'Yes, Brownsmith's there. He can save the bank, and no one else. Hush, you fellows; here he comes.'

Hargrave looked with a curiosity he could not restrain; he held his wife's hand as he looked. The door opened, and out came a thin, seedily-dressed man in a brown spencer. It was the old gentleman of the omnibus; yes, it was beyond a doubt the same, even to his faded umbrella!

Messrs Brettles, Crevasse, and Glashier, pale and anxious, followed him, expostulating.

Once, and once only, he turned, and addressed them. 'Not a sixpence,' he said. 'I advised honesty, and you would not try it. Now, you want a loan, and I refuse it—yes, finally refuse it. I'll never enter this bank again.—Good-morning, gentlemen. Another time, try honesty—take my advice.'

'This is unchristian,' said Crevasse.

'Unbusiness-like,' said Glashier.

'D—impertinent,' said Brettles. 'Before the clerks too.'

The great capitalist made no reply, but walked straight out, casting a glance on every clerk he met. Half-way to the door he stopped, fixed his eyes steadily on Hargrave and his wife, baby and Betsy, and going up to them, handed Hargrave a letter.

'Read it,' he said, 'at your leisure, and let me hear. I thought I should find you here. Good-bye, till we meet again.'

As the door closed on Brownsmith, Hargrave opened the letter, and taking Grace's arm, they read it together. It ran thus:

DEAR SIR—An act of kindness sometimes bears fruit. I am sorry to see you connected with such a bank. Our excellent cashier is getting old, and wants help. Will you act as his deputy? I have no doubt you will finally replace him, and become most useful to us. I am sure we shall get on well together.—I am, dear sir, yours faithfully,

JOSEPH BROWNSMITH.

With what glad hearts Hargrave and Grace left that doomed house, through the diamond-holes in whose shutters the three directors, pale and alarmed, mounted on chairs, were watching the mob outside, under the supervision (as to the chairs) of the active and indefatigable Cross. That night, the Ostend steamer bore off to the sheltering continent three as great and plausible rogues as the London commercial world had ever known; their pockets were by no means empty, nor their trunks either. The New World was very soon afterwards enriched by the addition of three enlightened citizens—a great *bon-vivant*, a great philanthropist, and a commercial genius.

When Hargrave opened the door of his cottage that evening, a visiting-card lay on the hall-table. He handed it laughingly to Grace. It bore the name of 'Mrs Grandsham,' and below was written:

MY DARLING MRS HARGRAVE—That horrible bank closed an hour ago. So sorry for you. Always feared it.

'Horrid old woman!' said Grace; 'I detest her. So pleased to give pain.—But how wonderful

that shabby old gentleman should turn out a millionaire, who could help us just in this time of trouble too!'

'God has indeed been good to us, Grace,' said he. 'But even in ruin, your love would have supported me, dearest.'

Hargrave has long ago become a junior partner in the firm of Brownsmith & Co., and as successful and deservedly respected a man of business as any one within sound of Bow Bells. The little act of kindness did indeed bear fruit—the shilling was returned with interest.

THE MONTH:

SCIENCE AND ARTS.

THE reappearance of the November meteors—the fiery shower, as some observers delight to call it—has furnished a subject for remark and discussion, which astronomers and students of physical science generally have made much of, and will yet make more. The state of the weather was so favourable for observation, and the number of meteors was so great, that the spectacle will not soon be forgotten by those who witnessed it; though whether it was really so 'sublime' or 'magnificent' as some describe, may fairly be questioned. It was, however, a very impressive sight, and especially interesting as a demonstration of the accuracy of the calculations on which the time of the phenomenon had been predicted. When the reports come in from other parts of Europe and the United States, we shall have further details as to the number of meteors observed; whether any remarkable varieties occurred in their appearance, and whether any have actually fallen on the earth. If not, the question arises: Shall we always escape? or shall we in some of our future passages across the belt of meteors, find ourselves pelted with heavy masses, involving danger and destruction?

Mr Daubrée, a French geologist, has made a series of synthetic experiments relative to meteorites, with a view to extend the knowledge of those strange bodies which we have derived from analysis: an important subject, for it may lead to a widening of our geological horizon, as well as to astronomical results. He shews that in no single instance has a meteorite been found containing granite or gneiss, nor any of the rocks therewith associated in our own globe. But the substance known as peridot is found in meteorites; and this same substance is at times thrown out from great depths in the earth by the eruptions of volcanoes; from which Mr Daubrée concludes that the planetary bodies (or whatever may be the source of the meteorites) are in a less advanced stage of evolution than our own globe; and he attributes our superiority to the ocean, to the co-operation of which we owe the origin of granitic and of the stratified rocks: and he thinks that the ubiquity of peridot is explained by its being, in some sort, a 'universal scoria.'

In his opening address to the Royal Institute of British Architects, the President, Mr Beresford Hope, mentioned that the Institute had offered a prize for the best design for a Gothic theatre, and expressed his hope that the response would be a hearty one. He considers the Gothic style well adapted for a theatre, inasmuch as each of its lower stories legitimately throws up its shafts to support the one above, and does not necessitate the sticking

out of tiers of boxes like trays from the walls. After other suggestions, Mr Hope said, 'for these reasons, I venture, in the name of progress and of eclecticism, to call on all here present to aid in vindicating the theatre no less than the church as a legitimate object for Gothic treatment; at the same time, I conjure the competitors to consider seriously how they may reduce the risk of fire.'

Mr Hope noticed the improvements which the Marquis of Westminster is making in the Belgravia district, where rebuilding in a handsome style, and on a very extensive scale, is now in progress. He dwelt with emphasis on the endeavours now in progress for the better housing of the labouring classes, on the care taken for the integrity of our public parks and open spaces, and stated that 'what remains of Epping Forest is also to pass into the category of public parks, by being transferred from the Office of Woods and Forests, which only regards the financial value of its trusts, to that of Public Works, which deals with them for the general recreation and the decorative improvement of the ground.' This latter fact will be hailed with pleasure by thousands of Londoners.

As is well known, animal and vegetable substances can be kept for any length of time in perfectly air-tight cases, especially if the air be pumped out from the inside. Dr Louvel of Paris has demonstrated the fact on a large scale under supervision of a Commission appointed by the French government, and with results that are well worth attention. His apparatus consists of a large sheet-iron cylinder, fitted with a man-hole at the top, a hopper below, and an instrument to measure the amount of vacuum, which is produced in the usual way by a forcing-pump. Three such cylinders were set up at Vincennes, two being in the open air; and in July 1864, in presence of the Commission, fifty hectolitres of wheat and twenty litres of lively weevils were poured into one of the cylinders, which was then closed, and the air exhausted by eight men pumping for forty minutes. A ton of half-eaten biscuit, swarming with worms and weevils, was put into another cylinder; a ton of best flour into the third; and both were treated in the same way as the first. In January 1865, the cylinders were opened: the wheat in the first was in excellent preservation, not a grain was eaten, and of the weevils, nothing remained but dry empty skins. They had been laid in layers all through the wheat, but it was nowhere injured, and it was afterwards sold at the full market-price. The half-eaten biscuits were in the same condition as when put into the cylinder, but the worms and weevils were all dead, and completely dried up. The flour was unaltered: bread made from it was pronounced to be of the first quality.

With these results before them, we are not surprised to hear that the Commission fully approved of Dr Louvel's process, which seems the more satisfactory when we remember that two of the cylinders had been exposed out of doors to all changes of weather for six months. The same process has been adopted for the preservation of hops in cylinders tinned inside, and found to answer so well that there is neither loss of weight nor of the delicate aroma peculiar to the hop. Only let the process have a wider application, and there will be no such thing as perishable commodities, for all organic substances may thereby be preserved, with the further advantage, that products which would

not bear a long sea-voyage may be imported from all parts of the globe, however distant.

A new kind of button has just been invented, which can be fixed without the trouble of sewing. The mode of construction is similar to that of the paper-fastener seen in stationers' shops, two strips of pliable metal or wire being introduced as fastening. These strips are fixed to the back of the button; are passed through a small slit in the cloth or linen, and are then bent down tightly upon a small washer of metal, which gives them firm hold, and is supplied with the button. Though susceptible of improvement, this appears to us the best among the many self-fastening buttons over which inventors have puzzled their brains.

Dr Daubeny has published a short paper, which he read at the last meeting of the British Association, containing a statement of the number of B.A. degrees conferred by the university of Oxford in each year from the middle of the 17th century until now; and he points out that the increase in the number is by no means proportionate to the progress of the realm in population, wealth, and intelligence. There were more B.A.'s to each 5,000,000 of the population formerly than at the present time. Among the causes for this difference, Dr Daubeny places the fact, that a university education is regarded rather as a preparation for the church than for the liberal professions generally, and to a mistaken notion as to the cost of university education. He shews that a scientific education may be obtained in Oxford at a moderate cost, and with important advantages.

The severe and destructive floods which still shew their effects in our northern counties, will, it is to be hoped, lead to the adoption of preventive measures, such as may be derived from an intelligent application of meteorological data and principles of mechanical science. As an example, we mention what has been done at Lyon. That city is built on low ground, at the confluence of the Saone and Rhone, and is very liable to inundation. Twenty years ago, rain-gauges were set up at different places along each of the two river-valleys, particularly in the upper parts about the water-shed. These were regularly observed, their indications estimated, and whenever a flood seemed impending, notice of its probable height was sent down to the city, where measures were taken according to the circumstances to remove merchandise to warehouses above the line of danger, and to warn people whose houses were threatened.

In a paper on Cyclones read before the Academy of Sciences at Paris, the author states as a rule by which to know the position of the centre of the cyclone, always the most dangerous point, that if the observer places himself directly facing the wind, the centre will be on his left hand.—The French government have made a survey of the Brazilian coast between the La Plata and the Amazons, in which there were taken 178,000 angles and 160,000 soundings.—The Hudson's Bay Company have provided the materials for an electric telegraph across their territory.—In India, there are 14,500 miles of telegraph belonging to the government, and 3141 miles owned by the eight railway companies.

The project of a twice-a-month mail to the antipodes has at length been realised, and a line of steamers is now established between Panama and Australia across the whole breadth of the Pacific—8000 miles. Thus, by way of the West

as well as the East, letters can now be received and despatched; an advantage which will be appreciated alike in the colonies and at home. Among the items of news by the last mail *via* Panama is one that will be especially interesting to paleontologists. Dr Hector, F.R.S., Director of the government geological survey of New Zealand, has sent to this country drawings of a portion of a Moa's egg enclosing a skeleton of the chick, which proves that the process of hatching was well advanced when the egg was broken. Every instalment of information on this subject will be acceptable to naturalists, for it is said that the Moa, the giant bird of New Zealand, is not yet extinct, that living specimens are sometimes seen by the natives in inaccessible places; hence, if one could be captured, there would be the more interest in comparing it with the fossil remains of the Moa of bygone ages.

The bronze statue set up in the open space near the Duke of York's Column to commemorate Sir John Franklin, is a noteworthy work of art. It represents the ill-fated arctic explorer in a dignified attitude, while a well-executed bas-relief on the pedestal offers a pathetic and picturesque memorial of the closing scene of his eventful career.

OUR LANE.

When the grass springs, and soft winds blow,
And hawthorns wear the only snow;
When lads and lasses stop once more
To play about the school-house door;
And lambs are white upon the leas,
And stars on the horse-chestnut trees,
And birds begin to build again—
'Tis sweet to watch them in Our Lane.

When swallows have their summer made;
And lazy sheep move with the shade;
And the dew loiters on the grass,
Where sweet-breathed cows gaze as you pass;
When greedy trout leap by the mill;
And youth goes gaily down the hill—
Who would not be a lad again,
To meet his lassie in Our Lane?

When gossamer floats everywhere;
And golden apples scent the air;
And round about their ancient roots,
Vast pear-trees shower their tiny fruits;
And red plums blush 'midst yellow leaves;
And summer-friends have left our eaves;
When oaks their leaves no longer hold,
And chestnut-trees change green for gold;
And wheat is stacked and sown again—
Then wondrous tints light up Our Lane.

When cheeks look brighter 'gainst the snow;
And crimson holly-berries glow,
And ivy reigns, and yew-trees sneer
At oak and elm, now sad and drear;
When apples all are pressed or stored;
And ants sit proudly by their hoard;
When pleasant paths look dull and gray,
And old men rest upon their way;
And black-birds know not where to feast,
And all their pleasant songs have ceased—
Let them be thankful in Our Lane,
If hips and haws may yet remain.

Hearken to what wise black-birds say:
'Our spring saw many a merry day;
In summer, there were strawberries;
In autumn, we'd the filbert trees:
We tasted all the year could bring,
To mellow autumn from bright spring.
If nuts and cherries all are gone,
There's something to look back upon:
We deem not life unjust because
It comes at last to hips and haws.'

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